

Serial No. 10/763,551
Docket No. NEC 03USFP936
Amendment B

AMENDMENTS TO THE CLAIMS:

Kindly amend claims 1 and 9, as shown below. This listing of claims will replace all prior versions and listings of claims in the Application:

Claim 1 (currently amended): A semiconductor device comprising:

a semiconductor region of a first conductive type;

first and second regions of a second conductive type opposite to the first conductive type, wherein said first and second regions are provided in a surface of said semiconductor region in a predetermined interval;

a third region of said first conductive type which is provided between said first and second regions in said surface of said semiconductor region; and

a fourth region of said first conductive type which is provided below said third region inside said semiconductor region to cover the whole of bottom of said third region at least;

wherein said first, second and third regions are wells.

Claim 2 (original): The semiconductor device according to claim 1, wherein a position of an impurity peak concentration of said fourth region into a depth direction is deeper than a peak position of an impurity concentration in each of said first and second regions into the depth direction.

Claim 3 (previously presented): A semiconductor device comprising:

a semiconductor region of a first conductive type;

first and second regions of a second conductive type opposite to the first conductive type, wherein said first and second regions are provided in a surface of said semiconductor region in a predetermined interval;

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a third region of said first conductive type which is provided between said first and second regions in said surface of said semiconductor region; and

a fourth region of said first conductive type which is provided below said third region inside said semiconductor region to cover the whole of bottom of said third region at least;

wherein a position of an impurity peak concentration of said fourth region into a depth direction is deeper than a peak position of an impurity concentration in each of said first and second regions into the depth direction;

wherein a minimum of an impurity peak concentration of said fourth region is $(1-s)*1.4E16$ (atom/cm³), where said predetermined interval is s (μ m).

Claim 4 (previously presented): A semiconductor device comprising:

a semiconductor region of a first conductive type;

first and second regions of a second conductive type opposite to the first conductive type, wherein said first and second regions are provided in a surface of said semiconductor region in a predetermined interval;

a third region of said first conductive type which is provided between said first and second regions in said surface of said semiconductor region; and

a fourth region of said first conductive type which is provided below said third region inside said semiconductor region to cover the whole of bottom of said third region at least;

wherein a position of an impurity peak concentration of said fourth region into a depth direction is deeper than a peak position of an impurity concentration in each of said first and second regions into the depth direction;

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wherein the position of the impurity peak concentration in the fourth region into the depth direction is deeper in a range of 0.3 to 0.8 μm than that of the impurity peak concentration in each of said first and second regions.

Claim 5 (previously presented): The semiconductor device according to claim 4, wherein a minimum of said impurity peak concentration of said fourth region is $(1-s) \cdot 1.4\text{E}16$ (atom/ cm^3), where said predetermined interval is s (μm).

Claim 6 (previously presented): A semiconductor device comprising:

a semiconductor region of a first conductive type;

first and second regions of a second conductive type opposite to the first conductive type, wherein said first and second regions are provided in a surface of said semiconductor region in a predetermined interval;

a third region of said first conductive type which is provided between said first and second regions in said surface of said semiconductor region; and

a fourth region of said first conductive type which is provided below said third region inside said semiconductor region to cover the whole of bottom of said third region at least;

wherein a position of an impurity peak concentration of said fourth region into a depth direction is deeper than a peak position of an impurity concentration in each of said first and second regions into the depth direction;

wherein said impurity peak concentration of said fourth region becomes higher as said predetermined interval becomes narrower.

Claim 7 - 8 (cancelled)

Claim 9 (currently amended): A semiconductor device comprising:

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a semiconductor region of a first conductive type;

first and second regions of a second conductive type opposite to the first conductive type, wherein said first and second regions are provided in a surface of said semiconductor region in a predetermined interval;

a third region of said first conductive type which is provided between said first and second regions in said surface of said semiconductor region; and

a fourth region of said first conductive type which is provided below said first to third regions inside said semiconductor region to cover the whole bottoms of said first to third regions;

wherein said first, second and third regions are wells.

Claim 10 (original): The semiconductor device according to claim 9, wherein a position of an impurity peak concentration of said fourth region into a depth direction is deeper than a peak position of an impurity concentration in each of said first and second regions into the depth direction.

Claim 11 (previously presented): A semiconductor device comprising:

a semiconductor region of a first conductive type;

first and second regions of a second conductive type opposite to the first conductive type, wherein said first and second regions are provided in a surface of said semiconductor region in a predetermined interval;

a third region of said first conductive type which is provided between said first and second regions in said surface of said semiconductor region; and

a fourth region of said first conductive type which is provided below said first to third regions inside said semiconductor region to cover the whole bottoms of said first to third

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regions;

wherein a position of an impurity peak concentration of said fourth region into a depth direction is deeper than a peak position of an impurity concentration in each of said first and second regions into the depth direction;

wherein the position of the impurity peak concentration in the fourth region into the depth direction is deeper in a range of 0.3 to 0.8 μm than that of the impurity peak concentration in each of said first and second regions.

Claim 12 (previously presented): The semiconductor device according to claim 11, wherein a minimum of said impurity peak concentration of said fourth region is $(1-s)*1.4E16$ (atom/cm³), where said predetermined interval is s (μm).

Claim 13 (previously presented): A semiconductor device comprising:

a semiconductor region of a first conductive type;

first and second regions of a second conductive type opposite to the first conductive type, wherein said first and second regions are provided in a surface of said semiconductor region in a predetermined interval;

a third region of said first conductive type which is provided between said first and second regions in said surface of said semiconductor region; and

a fourth region of said first conductive type which is provided below said first to third regions inside said semiconductor region to cover the whole bottoms of said first to third regions;

wherein a position of an impurity peak concentration of said fourth region into a depth direction is deeper than a peak position of an impurity concentration in each of said first and second regions into the depth direction;

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wherein a minimum of said impurity peak concentration of said fourth region is $(1-s)*1.4E16$ (atom/cm³), where said predetermined interval is s (μm).

Claim 14 (previously presented): A semiconductor device comprising:

a semiconductor region of a first conductive type;

first and second regions of a second conductive type opposite to the first conductive type, wherein said first and second regions are provided in a surface of said semiconductor region in a predetermined interval;

a third region of said first conductive type which is provided between said first and second regions in said surface of said semiconductor region; and

a fourth region of said first conductive type which is provided below said first to third regions inside said semiconductor region to cover the whole bottoms of said first to third regions;

wherein a position of an impurity peak concentration of said fourth region into a depth direction is deeper than a peak position of an impurity concentration in each of said first and second regions into the depth direction;

wherein said impurity peak concentration of said fourth region becomes higher as said predetermined interval becomes narrower.

Claims 15 - 16 (cancelled)

Claim 17 (previously presented): A semiconductor device comprising:

a semiconductor region of a first conductive type;

first and second regions of a second conductive type opposite to the first conductive type, wherein said first and second regions are provided in a surface of said semiconductor region in a predetermined interval;

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a third region of said first conductive type which is provided between said first and second regions in said surface of said semiconductor region;

a fourth region of said first conductive type which is provided below said third region inside said semiconductor region to cover the whole of bottom of said third region at least;

a first isolation film provided between said first region and said third region; and

a second isolation film provide between said second region and said third region.

Claim 18 (previously presented): The semiconductor device according to claim 17, wherein said fourth region is provided to be separated away from said third region.

Claim 19 (previously presented): The semiconductor device according to claim 18, wherein said fourth region is provided to be separated away from said first and second regions.

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